

RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

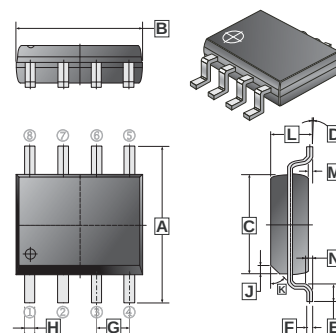
DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe SOP-8 saves board space.
- Fast switching speed.
- High performance trench technology.

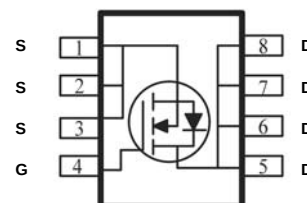
SOP-8



PACKAGE INFORMATION

Package	MPQ	LeaderSize
SOP-8	2.5K	13' inch

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				



MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Ratings	Unit	
Drain-Source Voltage	V _{DS}	30	V	
Gate-Source Voltage	V _{GS}	±20	V	
Continuous Drain Current ¹	I _D @ T _A = 25°C	9.4	A	
	I _D @ T _A = 70°C	7.4	A	
Pulsed Drain Current ²	I _{DM}	30	A	
Continuous Source Current (Diode Conduction) ¹	I _S	1.6	A	
Total Power Dissipation ¹	P _D @ T _A = 25°C	3.1	W	
	P _D @ T _A = 70°C	2	W	
Operating Junction & Storage Temperature Range	T _J , T _{STG}	-55 ~ 150	°C	
THERMAL RESISTANCE RATINGS				
Maximum Junction to Ambient ^a	t ≤ 10 sec	R _{θJA}	50	°C / W
	Steady State		92	°C / W

Notes:

- 1 Surface Mounted on 1" x 1" FR4 Board.
- 2 Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	-	V	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 24\text{V}$, $V_{GS} = 0\text{V}$
		-	-	25	μA	$V_{DS} = 24\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	20	-	-	A	$V_{DS} = 5\text{V}$, $V_{GS} = 10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	22	m Ω	$V_{GS} = 10\text{V}$, $I_D = 9.2\text{A}$
		-	-	30		$V_{GS} = 4.5\text{V}$, $I_D = 7\text{A}$
Forward Transconductance ¹	g_{fs}	-	40	-	S	$V_{DS} = 15\text{V}$, $I_D = 9.2\text{A}$
Diode Forward Voltage	V_{SD}	-	0.7	-	V	$I_S = 2.3\text{A}$, $V_{GS} = 0\text{V}$
Dynamic ²						
Total Gate Charge	Q_g	-	4.0	-	nC	$I_D = 7\text{A}$
Gate-Source Charge	Q_{gs}	-	1.1	-		$V_{DS} = 10\text{V}$
Gate-Drain Charge	Q_{gd}	-	1.4	-		$V_{GS} = 4.5\text{V}$
Input Capacitance	C_{ISS}	-	720	-	pF	$f = 1\text{ MHz}$
Output Capacitance	C_{OSS}	-	165	-		$V_{DS} = 15\text{V}$
Reverse Transfer Capacitance	C_{RSS}	-	60	-		$V_{GS} = 0\text{V}$
Turn-On Delay Time	$T_{d(on)}$	-	16	-	nS	$V_{DD} = 10\text{V}$
Rise Time	T_r	-	5	-		$I_D = 1\text{A}$
Turn-Off Delay Time	$T_{d(off)}$	-	23	-		$V_{GEN} = 10\text{V}$
Fall Time	T_f	-	3	-		$R_L = 6\Omega$

Notes:

- 1 Pulse test : $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.
- 2 Guaranteed by design, not subject to production testing.

CHARACTERISTICS CURVE

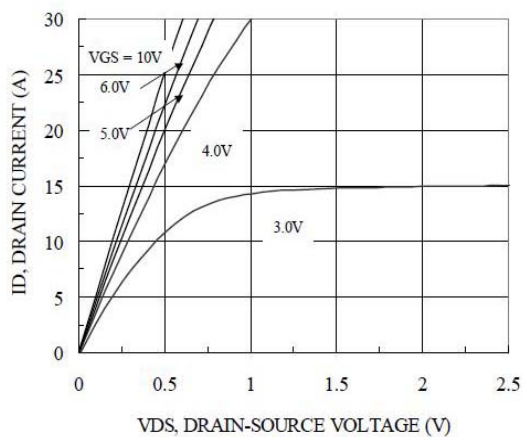


Figure 1. On-Region Characteristics

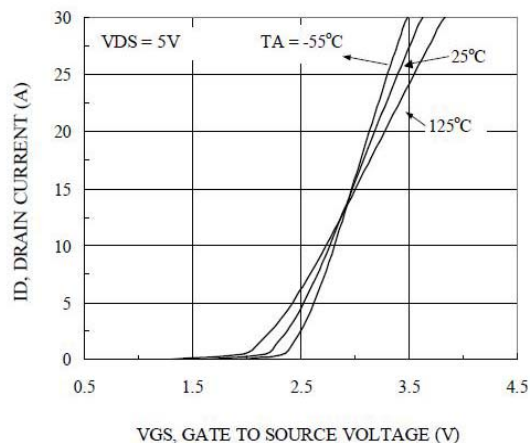


Figure 2. Body Diode Forward Voltage Variation with Source Current and Temperature

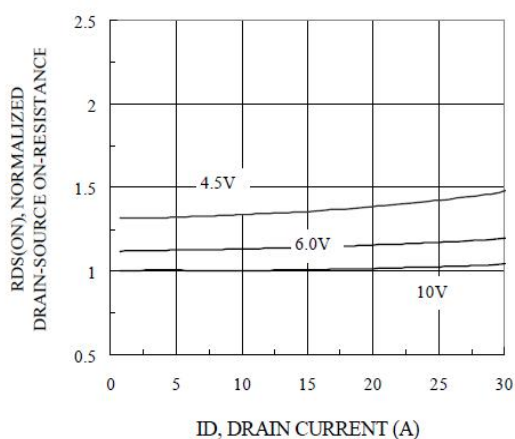


Figure 3. On Resistance Vs V_{GS} Voltage

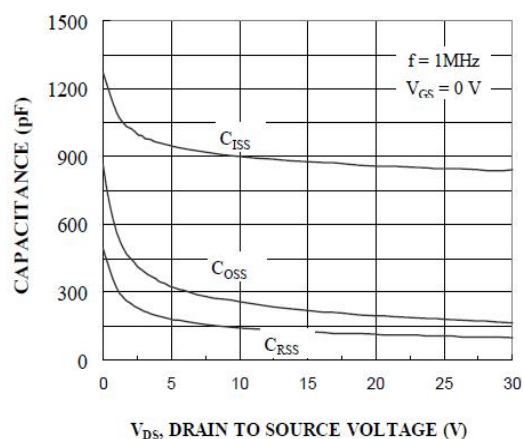


Figure 4. Capacitance Characteristics

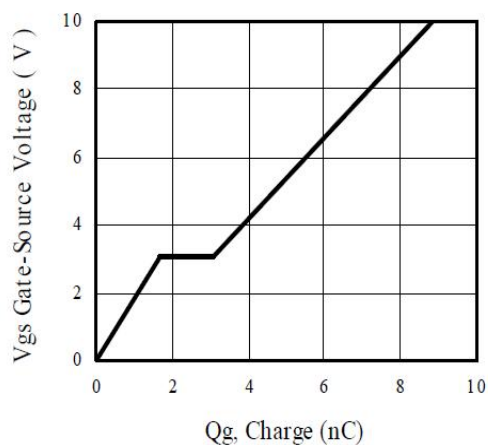


Figure 5. Gate Charge Characteristics

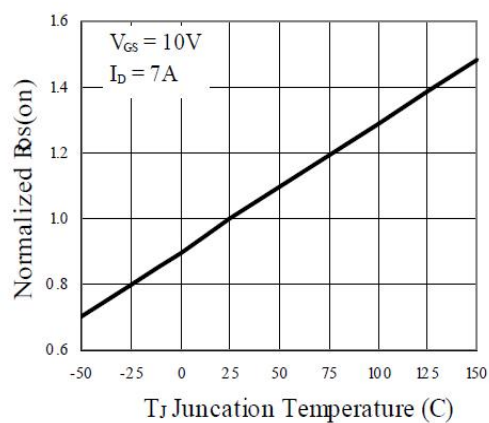


Figure 6. On-Resistance Variation with Temperature

CHARACTERISTICS CURVE

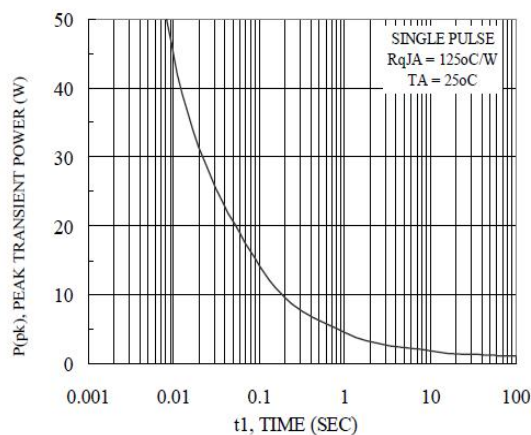
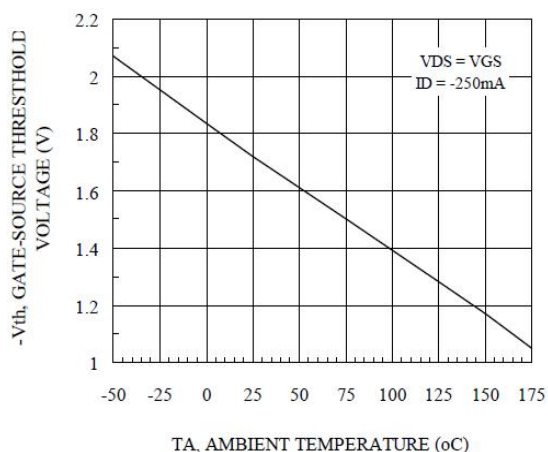
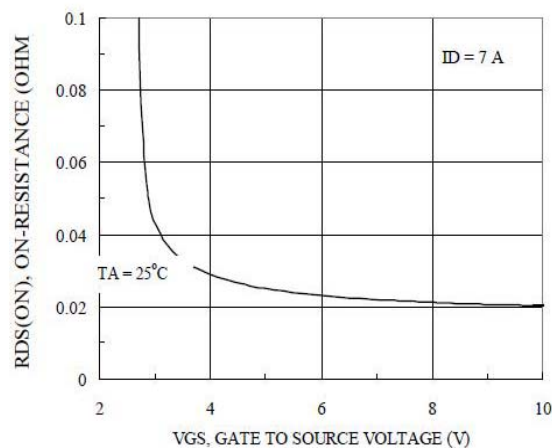
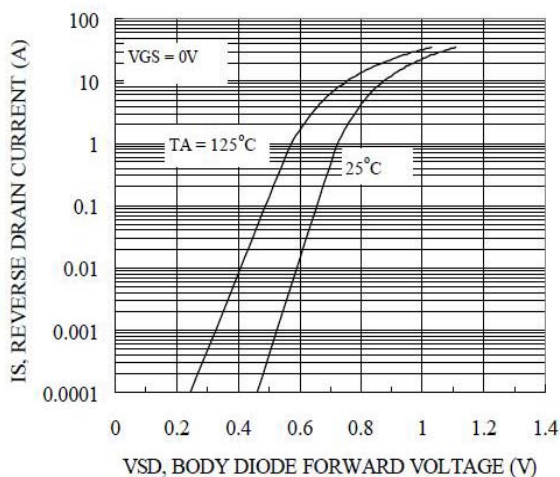


Figure 9. V_{th} Gate to Source Voltage Vs Temperature

Figure 10. Single Pulse Maximum Power Dissipation

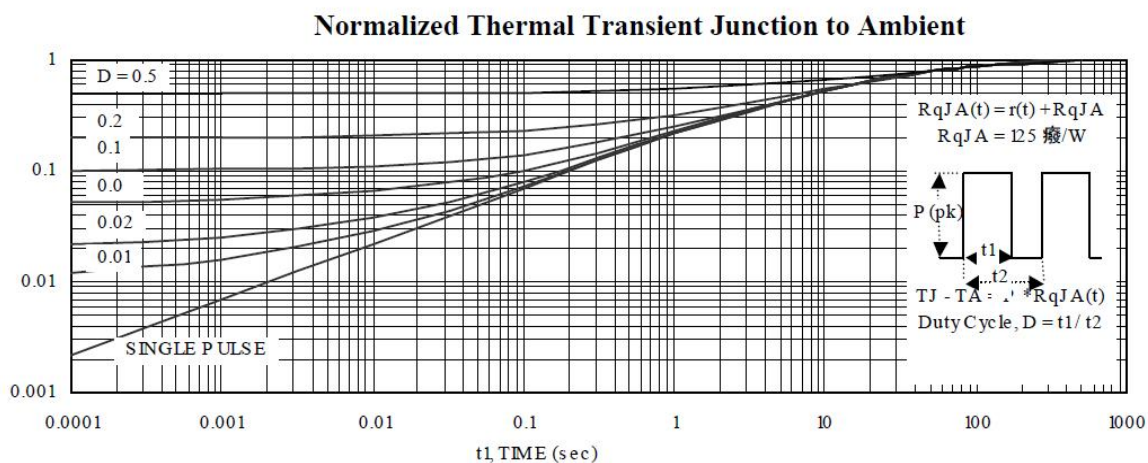


Figure 11. Transient Thermal Response Curve